EXAMPLE 4

5'-*O*-DMT-3'-*O*-(2-methoxyethyl)-N^4-benzoyl-5-methyl-cytidine-2'-*O*-(2-cyanoethyl-N,N-diisopropyl) phosphoramidite

[0133] 5'-*O*-DMT-3'-*O*-(2-methoxyethyl)-N^4-benzoyl-5-methyl-cytidine-2'-*O*-(2-cyanoethyl-N,N-diisopropyl) phosphoramidite was obtained from the above nucleoside using the phosphitylation protocol described for the corresponding 5-methyl-uridine derivative.

EXAMPLE 5

N^6-Benzoyl-5'-O-(DMT)- 3'-O-(2-methoxyethyl) adenosine

[0134] A solution of adenosine (42.74 g, 0.16 mol) in dry dimethyl formamide (800 mL) at 5 °C was treated with sodium hydride (8.24 g, 60% in oil prewashed thrice with hexanes, 0.21 mol). After stirring for 30 min, 2-methoxyethyl bromide (0.16 mol) was added over 20 min. The reaction was stirred at 5 °C for 8 h, then filtered through Celite. The filtrate was concentrated under reduced pressure followed by coevaporation with toluene (2x100 mL). The residue was adsorbed on silica gel (100 g) and chromatographed (800 g, chloroform-methanol 9:14:1). Selected fractions were concentrated under reduced pressure and the residue was a mixture of 2'-*O*-(2-(methoxyethyl) adenosine and 3'-*O*-(2-methoxyethyl) adenosine in the ratio of 4:1.

[0135] The above mixture (0.056 mol) in pyridine (100 mL) was evaporated under reduced pressure to dryness. The residue was redissolved in pyridine (560 mL) and cooled in an ice water bath. Trimethylsilyl chloride (36.4 mL, 0.291 mol) was added and the reaction was stirred at

5 °C for 30 min. Benzoyl chloride (33.6 mL, 0.291 mol) was added and the reaction was allowed to warm to 25 °C for 2 h and then cooled to 5 °C. The reaction was diluted with cold water (112 mL) and after stirring for 15 min, concentrated ammonium hydroxide (112 Ml) was added. After 30 min, the reaction was concentrated under reduced pressure (below 30 °C) followed by coevaporation with toluene (2x100 mL). The residue was dissolved in ethyl acetate-methanol (400 mL, 9:1) and the undesired silyl by-products were removed by filtration. The filtrate was concentrated under reduced pressure and then chromatographed on silica gel (800 g, chloroform-methanol 9:1). Selected fractions were combined, concentrated under reduced pressure and dried at 25 °C/0.2 mmHg for 2 h to give pure N^6-Benzoyl-2'-*O*-(2-methoxyethyl) adenosine and pure N^6-Benzoyl-3'-*O*-(2-methoxyethyl) adenosine.

[0136] A solution of N^6-Benzoyl-3'-*O*-(2-methoxyethyl) adenosine (11.0 g, 0.285 mol) in pyridine (100 mL) was evaporated under reduced pressure to an oil. The residue was redissolved in dry pyridine (300 mL) and DMT-Cl (10.9 g, 95%, 0.31 mol) was added. The mixture was stirred at 25 °C for 16 h and then poured onto a solution of sodium bicarbonate (20 g) in ice water (500 mL). The product was extracted with ethyl acetate (2x150 mL). The organic layer was washed with brine (50 mL), dried over sodium sulfate (powdered) and evaporated under reduced pressure (below 40C). The residue was chromatographed on silica gel (400 g, ethyl acetate-acetonitrile-triethylamine 99:1:195:5:1). Selected fractions were combined, concentrated under reduced pressure and dried at 25 °C/0.2 mmHg to give 16.8 g (73%) of the title compound as a foam. The TLC was homogenous.

EXAMPLE 6

[N^6-Benzoyl-5'-O-(DMT)-3'-O-(2-methoxyethyl) adenosin-2'-O-(2-cyanoethyl-N,N-diisopropyl) phosphoramidite

[0137] The title compound was prepared in the same manner as the 5-methyl-cytidine and 5-methyluridine analogs of Examples 2 and 4 by starting with the title compound of Example 5. Purification using ethyl acetate-hexanes-triethylamine 59:40:1 as the chromatography eluent gave 67% yield of the title compound as a solid foam. The TLC was homogenous. ^{31}P-NMR ($CDCl_3$, H_3PO_4 std.) δ 147.89; 148.36 (diastereomers).

EXAMPLE 7

5'-O-(DMT)-N^2-isobutyryl-3'-O-(2-methoxyethyl) guanosine

A. 2,6-Diaminopurine riboside

[0138] To a 2 L stainless steel Parr bomb was added guanosine hydrate (100 g, 0.35 mol, Aldrich), hexamethyl) disilazane (320 mL, 1.52 mol, 4.4 eq.), trimethyl) silyl triflouromethanesulfonate (8.2 mL), and toluene (350 mL). The bomb was sealed and partially submerged in an oil bath (170 °C; internal T 150 °C, 150 psi) for 5 days. The bomb was cooled in a dry ice/acetone bath and opened. The contents were transferred with methanol (300 mL) to a flask and the solvent was evaporated under reduced pressure. Aqueous methanol (50%, 1.2 L) was added. The resulting brown suspension was heated to reflux for 5 h. The suspension was concentrated